PI: Tobias, Dennis **PI's E-mail: dennis.tobias@ndsu.edu**

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Research Area: **FSTU-R** **Duration of Award: 1 Year**

Project Title: Rapid, Multiplex Real-Time PCR Method for Detection, Identification and Quantification of Fusarium spp.

PROJECT 1 ABSTRACT

(1 Page Limit)

Marketability and prices of grains are currently based on DON concentration but not on the presence of other trichothecenes. Several *Fusarium* spp. also produce other mycotoxins, aside from DON, such as 3A-, 15A-DON, zearalenone, T-2 and HT-2. There has been indication on a shift in *Fusarium* mycotoxin profile in barley- a decrease in Type B and an increase in Type A trichothecenes. Therefore, there is a need to conduct an up to date assessment of *Fusarium* spp. that are present in naturally-infected wheat and barley grains and their associated mycotoxins. The ability to rapidly detect *Fusarium* species and evaluate the trichothecene chemotypes in collected wheat and barley grains across the state of ND is important due to the significant number of grain samples and the differences in the toxicity of these secondary metabolites. Detection, identification and quantification of FHB-associated *Fusarium* species could be accomplished by using multiplex real time polymerase chain reaction (PCR)-based method. The goal of this project is to develop a rapid and reliable real-time quantitative PCR assay. This high-throughput assay will help screen the thousands of samples needed to accurately assess the distribution of *Fusarium* spp. within the region. The project objectives are (1) to facilitate a rapid identification and quantification of specific *Fusarium* species in ND wheat and barley grains; (2) to provide reliable and accurate information on the profile of FHB-related *Fusarium* spp. in naturally-infected ND wheat and barley grains; and (3) to assess the distribution of *Fusarium* spp. in this region in relation to the associated mycotoxins.